Inflation Persistence in the Euro Area: What have we Learned

Concluding Panel

Remarks by

Axel A. Weber
Introduction

• It is a great pleasure for me to take part in this conference. It is really impressive that so much has already been achieved within the Inflation Persistence Network and that a huge amount of data has been collected for this project.

• What is particularly astonishing is the amount of micro data that have not been available for research before. This represents a major step forward and shows how productive cooperation between experts from the ECB and the NCBs can be.

• Understanding the dynamics of inflation in the euro area is of fundamental importance for monetary policy decisions of the Governing Council of the ECB.
Overview

I want to concentrate on three interrelated issues which seem crucial to the framework of the network:

• What are the new stylised facts the IPN has identified? And to what extent do they present challenges to our understanding of the price formation process?
• What determines inflation persistence?
• What are the implications for monetary policy?
IPN: Some New Stylized Facts

• First, analysing micro data, flexibility seems to be quite high, but lower than in the US.
  • It would be interesting to learn more about the reasons for such differences. Differences with regard to the labour market come immediately to mind.

• Second, there seem to be fewer downward rigidities than is often assumed.
  • This is striking as there has been much discussion about the need to aim at an inflation rate well above zero.
IPN: Some New Stylized Facts

•Third, there seem to be remarkable differentials between sectors. It has been shown, for example, that non-processed food and energy display considerably less persistence than services.

  •I wonder whether a measurement problem may play a part in this outcome.

  •It might be the case, for example, that services (ie a hair cut) are less standardised than a energy (ie a litre of petrol).
First, there seem to be both time-dependent and state-dependent elements in price setting. Let me start with the German example.

- The peaks in the distribution of price durations is at 12 and 24 months.
- The level of synchronisation of price changes is low.
- The evidence of seasonality in pricing suggests time-dependent pricing.
- In the case of consumer prices, the bunching of price changes related to marginal costs shock or to special events, such as VAT changes or the cash change-over, point to state-dependent elements (see paper by Hoffmann and Kurz-Kim). This is confirmed by several studies using micro-data and applying duration analysis.
IPN: Determinants of Persistence

- The driving force behind state-dependence is the change of relative prices, and the trend growth common to all prices, that is inflation.

- Second, the degree of competition may influence price rigidities in various ways. The role of explicit or implicit contracts in hampering price adjustment has to be mentioned in this context.

- However, what type of contracts a firm is ready to accept is not independent of competition in the relevant market.

- In my view, greater competition generally helps to reduce rigidities in the price formation process.
Third, the IPN concentrates on the price formation process. However, marginal costs are also of crucial importance for understanding this process.

It might thus be worthwhile also taking a closer look at some costs factors, and the wage formation process in particular, in the coming months.

It would also certainly be of interest to see whether we can already identify changes in the price formation process during the last few years.
IPN: Implications for Monetary Policy

- First, there have been several papers – inside and outside – the IPN which have stressed that price rigidity is not independent of monetary policy (Paloviita, Orphanides and Williams).
  - A stable monetary policy regime helps to reduce inflation persistence.
  - On the other hand, uncertainty about the central bank’s targets has unfavourable consequences for price flexibility.
IPN: Implications for Monetary Policy

• Second, inflation persistence and the degree of competition may differ across the participating countries in a monetary union.

• It has been argued, for example, that a monetary policy which assigns a greater weight to countries with a higher degree of inflation persistence produces a better outcome than simply targeting the area-wide rate of inflation.

• However, such advice comes with a considerable incentive problem: as a result, countries with a large degree of inflation persistence may have a weak incentive to reduce their rigidities.
IPN: Implications for Monetary Policy

• Finally, due to competitive forces (real exchange rate changes) inflation rigidities in a monetary union may not be independent from the level of inflation, or rather, the deviation of countries inflation rates from the average inflation rate of the monetary union.

• This is shown in a recent paper by Beck and Weber (2004), who estimate the degree of persistence in the distribution dynamics of regional inflation rates within EMU (72 regions from 6 EMU countries).
<table>
<thead>
<tr>
<th>Table 1, updated version</th>
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<tbody>
<tr>
<td><strong>Table 6.1: Countries and Regions/Cities included in our Study</strong></td>
</tr>
<tr>
<td><strong>Germany (7 regions)</strong></td>
</tr>
<tr>
<td>Berlin, Nordrhein-Westfalen, Niedersachsen, Bayern, Saarland, Baden-Wuerttemberg, Hessen</td>
</tr>
<tr>
<td><strong>Austria (20 cities)</strong></td>
</tr>
<tr>
<td><strong>Finland (5 regions)</strong></td>
</tr>
<tr>
<td>Uusimaa, Southern Finland, Eastern Finland, Mid-Finland, Northern Finland</td>
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<tr>
<td><strong>Italy (20 cities)</strong></td>
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<tr>
<td><strong>Spain (18 provinces)</strong></td>
</tr>
<tr>
<td>Castilla la Mancha, Extremadura, Cataluna, Ceuta et Melilla, Galicia, Canarias, La Rioja, Madrid, Murcia, Asturias, Baleares, Navarra, Pais Vasco, Cantabria, Aragon, Andalucia, Valencia, Castilla Leon</td>
</tr>
<tr>
<td><strong>Portugal (7 regions)</strong></td>
</tr>
<tr>
<td>Centro, Alentejo, Algarve, Madeira, LVT, Acores, Norte</td>
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</table>
Figure 1, regional food inflation

Food price inflation
Data: Locations
Distribution Dynamics

The empirical approach:

• describe the persistence in the evolution of the entire distribution of EMU inflation rates as an AR(1) process

\[ F_{t+1} = T^* (F_t), \]

• F: cross-regional inflation distribution
• T*: Operator mapping period‘s t distribution into period‘s t+1 distribution
• T* will give us information on the dynamics of regional inflation rates
Distribution Dynamics

The continuous case:

Figure 7: Stochastic Kernel: Extended EMU Sample, Annual Transitions

Along the 45 degree line the deviations from cross-regional mean are expected to persist forever.
Distribution Dynamics

The continuous case:

... however: there is considerable persistence

Deviations from cross-regional mean are expected to vanish

Figure 8: Stochastic Kernel: European ”Extended Sample”, Annual Transitions, Contour Plot and Conditional Expected Mean Inflation Deviations

... and only weak (non-linear) dynamics towards the mean

Lower persistence of extreme inflation

High inflation is more persistent than low inflation
Distribution Dynamics

The continuous case (U.S. states /Canada provinces):

Figure 20: Stochastic Kernel: USA and Canada, Annual Transitions, Contour Plot and Conditional Expected Mean Inflation Deviations

Considerably lower persistence ... and stronger dynamics towards mean!
Distribution Dynamics

The continuous case (Japan, 47 prefectures):

Figure 18: Stochastic Kernel: Japan, Annual Transitions, Contour Plot and Conditional Expected Mean Inflation Deviations

The lowest persistence... and strongest dynamics towards mean!

Linear approximation
Distribution Dynamics

The discrete case:

• $T^*$ corresponds to transition matrix

\[ F_{t+1} = MF_t, \]

• Entry $(i,j)$ corresponds to conditional probability for moving from state $i$ in period $t$ to state $j$ in period $t+1$
Distribution Dynamics

The discrete case:

Table 8: Transition Probabilities - Annual Transitions - for the European "Extended" Sample, Deviations from Cross-Regional Mean and Quantiles

<table>
<thead>
<tr>
<th>Dev. in $t$</th>
<th>$&lt; -0.85$</th>
<th>$-0.25$</th>
<th>$0.25$</th>
<th>$0.85$</th>
<th>$&gt; 0.85$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt; -0.85$</td>
<td>0.54</td>
<td>0.34</td>
<td>0.10</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>$-0.25$</td>
<td>0.30</td>
<td>0.37</td>
<td>0.19</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>$0.25$</td>
<td>0.05</td>
<td>0.22</td>
<td>0.30</td>
<td>0.26</td>
<td>0.17</td>
</tr>
<tr>
<td>$0.85$</td>
<td>0.02</td>
<td>0.09</td>
<td>0.25</td>
<td>0.40</td>
<td>0.25</td>
</tr>
<tr>
<td>$&gt; 0.85$</td>
<td>0.01</td>
<td>0.04</td>
<td>0.16</td>
<td>0.34</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Intermediate inflation is more persistent than high or low inflation!
Conclusion

• Let me conclude by saying that I am impressed by the work that has already been done in the IPN;

• Since this is not the final but an intermediate conference I hope that some of the issues raised in my remarks can be taken aboard in future research on this topic.

• I and my colleagues on the Governing Council of the ECB look forward with great interest to further results – monetary policy should follow these studies carefully and take on board those lessons which are shown to be sufficiently robust.